

## **Mineral Systems Analysis of Variscan ore deposits: The need for geochemical data**

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Mineral Systems Analysis aims to provide a holistic understanding of geological processes required to form and preserve ore deposits at all scales [1]. Detailed knowledge of the ore-forming process alone does thus not suffice. Instead, comprehensive knowledge is required, taking into consideration all drivers of a given mineral system, including geodynamic setting and crustal architecture, crustal fertility (metal source), metal transport mechanism, processes of local concentration (trap) as well as postdepositional alteration and preservation. Robust conceptual models are the result of Mineral Systems Analysis; these models are used to efficiently identify exploration targets or target regions [2].

Mineral Systems Analysis has generally not been applied to the Variscan Orogen, despite its exceptional endowment in mineral deposits. This is attributable to a severe lack of modern geoscientific data for most of the known mineral deposits many of which have ceased production decades ago. As a direct consequence, our understanding of the mineral system of the Variscan Orogen is rather tentative. We illustrate the state of knowledge on selected examples and illustrate how the use of state-of-the-art geochemical data, combined with current regional geotectonic understanding, vastly improve our understanding – and enable us to carry out Mineral Systems Analysis. This, in turn, will provide a suitable foundation for future exploration targeting.

[1] Wyborn et al. (1994) *Australian Institute of Mining and Metallurgy Annual Conference, Melbourne, Proceedings*, 109-115.

[2] McCuaig et al. (2010) *Ore Geology Reviews*, 128-138.